THE GOVERNANCE STRUCTURE OF COOPERATIVE NETWORKS –
THE GENOLYPTUS CASE

Rosileia Milagres
Doutora em Economia pelo Instituto de Economia- Universidade Federal do Rio de Janeiro – UFRJ
Professora da Fundação Dom Cabral – FDC
rosileiam@fdc.org.br (Brasil)

Abstract
Cooperative networks constitute a critical unit of analysis in the context of innovation. Despite this, networks are complex to manage successfully. Some of the difficulties pointed out by authors are associated with the lack of specific management tools, problems related to governance, as well as asymmetries in terms of objectives. The present case study seeks to contribute to this debate by examining the governance and the tools used by the Genolyptus Network. The study demonstrates the importance of this structure and the need for regular investments in its development. The analysis shows that the governance structure is influenced by, the partners' experience, the types of knowledge and the context where the network is inserted. The case highlights the importance of learning during the process, but, although present, it can be negatively influenced by the context and the possibility of future partnerships.

Keywords: Network; Governance; Network structure; Network management; Knowledge transfer.

1.   INTRODUCTION

Although organizational literature dealing with the management of innovation is traditionally based on studies at the company level, growing evidence shows that "networks" constitute a critical unit of analysis (Gilsing, Lemmens, & Duysters, 2007; Gulati, 2007; Lee, 2007). The change in focus in investigating the innovative process stems from the recognition of the importance of the inter-organization learning phenomenon for innovation (Easterby-Smith, Lyles, & Tsang, 2008; Dyer & Hatch, 2006)).

A network can be understood in terms of connections, interactions and the exchange of knowledge and information. As knowledge is incorporated within individuals and their organizations, the agents and their interactions constitute a network. For Ring and Van De Ven (1994), networks include strategic alliances, partnerships, joint ventures, franchises, research consortia and other different forms of organization.

This study has focused on the cooperative relationships that are included in the networks formed by companies, universities and other organizations. It is worth emphasizing that, henceforth, the term network will be employed in this sense, that is to say, networks for cooperation between organizations.

Networks permit greater flexibility, require less commitment of resources, provide greater response capability and increase the ability to deal with knowledge/information, as well as providing access to new technologies resulting from partnerships (Britto, 1999). In effect, learning potential is enhanced in these environments, by taking advantage of capabilities that can be combined by means of establishing systematic channels for relationships with other organizations.

Despite this, networks are complex to manage successfully (Kale & Singh, 2007; Hughes & Weiss, 2007). Some of the difficulties pointed out by authors are associated with the lack of specific management tools, problems related to governance, asymmetries in terms of knowledge and objectives, as well as the adequate exchange of information. These are some of the factors cited as probably responsible for undesirable troubles in the networks field (Dyer, Kale, & Singh, 2004).

Given this, and hand in hand with the study of innovative processes in networks, there are increasing efforts to understand the management processes associated with them (Ring, Doz, & Olk, 2005; Reuer & Arino, 2007; Harryson, Dudkowski, & Stern, 2008). It is believed that a significant part of the success of these arrangements is linked to the establishment of adequate organizational governance and tools (Moller, Rajala, & Svahn, 2005; Moller & Rajala, 2007). These strengthen relationships of trust, creating a modus operandi that favours stability and guidance of actions, thus

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

8

fostering greater coordination, an increase in the exchange of knowledge, minimization of asymmetries and the elimination of opportunistic behaviour.

The objective of this study is to uncover the management mechanisms that permeate an intensive knowledge network in the Brazilian pulp and paper sector. With this in mind, the governance structure of the network was identified – councils, discussion forums etc. – together with the instruments by means of which the management processes and the transfer and creation of knowledge took place.

Among the findings highlighted is the contribution of research by means of identification, description and understanding of the governance structure and other management tools employed. Another finding is linked to a perception of the influence of the characteristics of the sector environment, which is characterized by a history of interrelationship and the accumulation of experiences of the firms involved in the cooperation agreements. This reduced the time needed for the development of processes and network management tools and knowledge, since some of these could be transferred from other collaborative arrangements within the sector. Another important aspect dealt with by the article was the influence that the type of knowledge exercised over the characteristics of the management structure utilized in the network.

This article is divided into seven sections, including this introduction. In the second part, the theoretical background that provides support for the development of this work is discussed. In the third part, the methodology that was developed is presented. The network under study and its history is shown in the fourth section. The fifth part described the network governance and its occurrences. The set of management and knowledge processes and tools created are discussed in the sixth part. The final section is divided into discussion and research implications.

2. THEORETICAL BACKGROUND

The current technological paradigm is characterized by the advance of information and telecommunication technologies. Besides this, the increasing complexity of market and clients' demands has forced companies to improve their capacity to deal with multiple types of knowledge. These facts have induced companies to frequently opt for establishing inter-organizational networks. They can be informal or formal and are used by firms that voluntarily subordinate part of their autonomy in exchange for access to capabilities that they do not possess.

An important motivation for the formation of these networks is the search for learning. As Malerba (1992) points out, there exist important sources for organizational learning and, among them,

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

9

he emphasizes the articulation between internal and external sources of knowledge. This type of knowledge is essentially a learning process by means of interaction.

Britto (1999) pinpoints two aspects of this learning process, which are the creation of technical knowledge and the development of mechanisms for the circulation of knowledge and information. In order to make viable joint efforts, it is necessary to establish the specific objectives and find a strategic fit. Besides this, explicit rules, processes and procedures which deal with an internal division of labour, the creation of mechanisms for the minimization of conflicts between the participants and clear-cut mechanisms for the sharing of results are necessary. Aside from these, cooperation agreement requires specific investments, such as the establishment of communication channels, development of a common language and codes that permit the circulation of knowledge. This means that the networks open up by *learning by learning*, which involves learning about the partners, the process of forming networks, the achieving of results and the establishing of common goals.

In an attempt to analyse and understand the management process of a network, Doz (1996) identified four different stages. In the first, he suggests that firms identify their initial conditions such as objectives, routines and expectations. The second stage is characterized by a learning process involving cooperation, capabilities to be developed and objectives to be pursued. In the third phase, the learning process leads to selection, in which re-evaluations of the partnership are made. Aspects such as efficiency, ability to adapt and financial capabilities are taken into account. Finally the process of re-evaluation leads to a new understanding with respect to the initial conditions, creating space for learning and the re-starting of the cycle.

An important characteristic to be observed is the understanding that the management processes for partnerships evolve and emerge in an incremental form, as a result of the learning process that occurred parallel to its evolution (Mahnke, 2000).

The process of learning by learning can be translated as proposed in Figure 1by Nielsen (2010). The motivation for alliance formation by each partner must lead to the strategic fit of partnership. The specificities of contractual governance are determined by strategic fit and mediate this initial objective to the alliance outcome. Contractual governance deals with the division of activities, rights and gains. Besides this, it stipulates the general commitment and the action plan. Procedural governance can be seen as the coordination mechanisms that take place during the evolution of the relationship and it acts as a mediator between contract and outcomes. It is composed of the mechanisms and instruments that govern the day-to-day interactions.
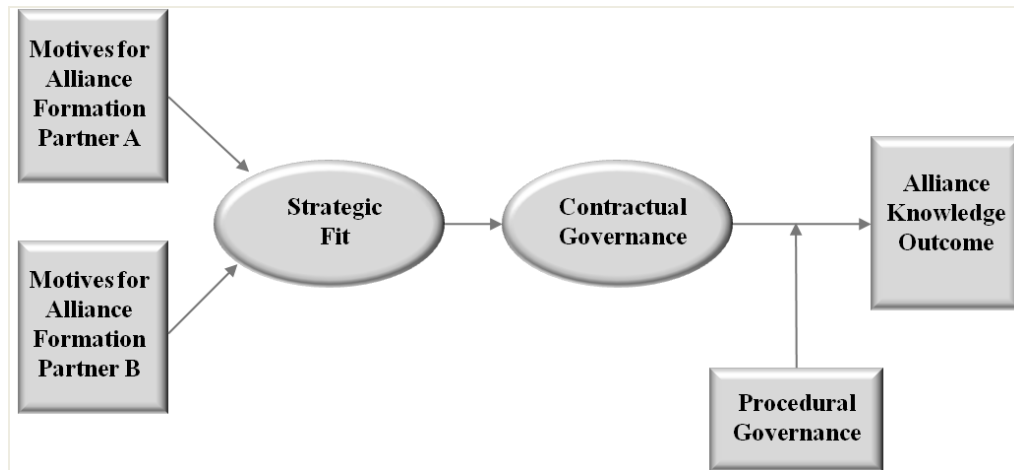
Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

10

Figure 1: The role of strategic fit and governance in determining alliance knowledge
Source: Nielsen, B. (2010). Strategic fit and the role of contractual and procedural governance alliances: a dynamic perspective. *Journal of Business Research 63*, 682-689.

As proposed by Ring and Van De Ven (1994), the inter-organizational partnership process is formed by repeated business negotiations, agreements and execution. First, the partners develop common expectations with regard to motives – the strategic fits – and investments to be made, and they map out the uncertainties present in the field. Then, they make an agreement – partners agree about the obligations and rules that will guide their behaviour. They establish formal, informal and psychological contracts that guide the relationship. By informal and psychological contracts, these authors mean an array of unwritten and/or unspoken expectations and suppositions. In the execution stage agreements and rules are put into practice. The process is characterized by interactions and, with the passage of time, conflicts, misunderstandings and new expectations will appear, leading to the development of other terms that will guide the contracts.

Beside the strategic fits, the design of the governance structure is influenced by different aspects, like experience, the characteristics of the context and knowledge.

Trust and reduction of risks are particularly important in the context of cooperation since the innovation process occurs in an environment characterized by incomplete information (Hagedoorn & Hesen, 2007). Consequently, problems of adverse selection (Giuri, Hagedoorn, & Mariani, 2002), opportunism and conflicts could emerge and create impediments to collaboration. In situations such as these, it is very difficult to develop commitment and maintain the arrangement.

Should the benefits of cooperative relationships become uncertain and take place only in the future *vis-à-vis* the opportunity costs of the present situation, the partners may adopt *free-rider* behaviour that limits their contribution. Lubatkin, Calori, Very and Veiga (1998) claim that, when dealing with the division of knowledge, the probability of occurrence of this problem is high. This is because knowledge includes results that are uncertain and difficult to measure. This can be avoided if

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

11

the partners want to maintain the cooperation. As the process becomes sequential, some partners who adopt more opportunist behaviour are penalized in future cooperative arrangements. The literature calls this phenomenon the "shadow of the future" (Parkhe, 1993). In this manner, reputation is structured as a protection against this type of behaviour.

Authors such as Granovetter (1985) point out that the ties that bind organizations, or the context into which they are inserted, must be considered. Different contexts create different behaviours, and, therefore, it is relevant to consider the existence of social control mechanisms. The author highlights the importance of social and organizational relations. For him, the embedded character of the relationships can create behaviour patterns that represent mechanisms which discourage opportunistic behaviour. This contributes to the establishment of relationships based on trust, which facilitates the complementarity of resources, especially those that are intangible. Aspects such as trust (Nooteboom, Berger, & Noorderhaven, 1997), relational capital (Dyer & Singh, 1998), history or possibility of partnerships and repetitive interactions (Gulati, 1995) can be considered to be mechanisms of social control and then influence the governance structure.

Larson (1992) affirms that prior to the formation of the partnership; the principal elements examined are the company´s reputation, previous relationships and personal aspects. These elements diminish the uncertainties and clarify expectations and obligations. After that, the structures for maintaining the partnership are created, such as rules and obligations, the expectations become clearer, and reciprocity and trust can grow. The last stage opens up to strategic and operational integration and social control.

Some studies have found a positive relationship between experience and performance, suggesting that the capacity to manage partnerships is accumulated from previous experience and leads to better future results (Powell, Koput & Smith-Doerr, 1996; Anand & Khanna, 2000). Simonin (1997) affirmed that firms develop abilities in choosing their partners, in the negotiation process, and in the management, coordination and monitoring of cooperative arrangements, as well as learning the best ways of ending the partnership and transferring the knowledge.

For Gulati (1995), experience deriving from past agreements allows learning of the context in which the alliances are inserted, the specificities of the partners, the formation of governance contracts and structures. In addition to these aspects, experience can promote trust, and, in this way, facilitate the agreement management process. Repeated partnerships can cause companies to act loyally and have an impact on future governances. In this case, since the management tools can be repeated, they tend to be more developed (Ness, 2009). In turn, they help to predict partners' behaviour, and, consequently promote trust.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

12

Nevertheless, it should be stressed that the authors that have discussed the importance of experience have also highlighted some aspects that must be considered (Heimeriks, Klijn, & Reuer, 2008; Heimeriks & Geert, 2007; Heimeriks, Duysters, & Vanhaverbeke, 2007; Sluyts, 2008; Rothaermel, 2006). Gulati (1995), for example, found limits to experience and its impacts on the design of network governance. According to the author, after a certain point, interactions between two companies diminish their attractiveness because they increase interdependence, diminish the possibilities of exchanges and limit the space for the search for other partners. Simonin (1997) demonstrated that a company's vast experience in collaboration was not sufficient to guarantee better results in future accords. The author concluded by affirming that experience needs to be converted into know-how, including how to transfer knowledge and manage information. For the author (*op.cit*.), the experience to be considered should take into account aspects such as history, intensity, longevity and types of collaboration.

In this sense, it can be said that knowledge of how to cooperate means that the information is filtered by the specificity of the context and the characteristics of the experience. Also to be considered is the fact that this knowledge may be a prisoner of the relationship because of the tacit aspects involved (Kogut & Zander, 1992).

As previously stated, the specificities of the utilized knowledge also exercise influence over the outlines of the governance. Aspects such as uncertainty in relation to the results to be obtained, complexity and the need for involvement with various areas of science, contribution for generation of competitive advantage, and consequently differentiation between companies and cumulativeness needed to be considered (Breschi & Malerba, 1997). These elements influence the relationship established between the partners, the design of the governance (Malerba, 2002) as well as impacting on the types of objectives established (Nielsen, 2010).

For the purposes of this study, this theoretical background makes its contribution by pointing out some specificities and elements that influence the governance structure.

3. METHODOLOGY

This case study seeks to understand and identify the contractual and procedural governance structure and the tools used by the Genolyptus network. The field study counted on the participation of the network representatives. In all, 42 interviews were conducted, with a total of 65 hours of transcriptions. In addition to this, all the memory of the network, represented by more than 3,200 e-mails exchanged between the members of the group, and all the official documentation produced within the network, such as minutes of meetings, reports, contracts, etc. were analysed.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

13

The case study was carried out in three stages. In the first, the objective was to understand, in a generic manner, how the network was structured, and the activities of the members, their global and specific objectives and its management. For this, the collection of information began with an interview with the network coordinator. In this phase, which took place between December, 2004 and March 2005, nine interviews were held. The participants selected were chosen by the coordinator and consisted of senior university researchers, as well as project coordinators from the companies. The interviews lasted between 45 and 140 minutes and were recorded and later transcribed. Some were held *in loco,* in the work environment of the interviewee (four) and others by means of teleconferencing (five).

In the second stage of the field research, access was granted to the complete set of documents produced by the network – all the e-mails exchanged between the participants from the period leading up to the formation of the network onwards, as well as the other official documents produced. This analysis was fundamental for understanding the processes and flow, and principally, for the identification of the procedural governance structure of the network. Once in possession of this body of information, new interviews with the coordinator were held, to confirm the initial understanding and for drawing up the final interview schedule.

In the third stage, new interviews were held with representatives of the companies and universities. Representatives from 13 companies, including those that participated in the first stage, and representatives of three universities were interviewed. This phase took place between the months of May and October, 2007. Thirty one interviews were held, lasting on average an hour and a half.

4. HISTORY AND DESCRIPTION OF THE NETWORK

According to the reasons presented for forming the Genolyptus Network, the preservation and growth of competitiveness of the Brazilian eucalyptus biomass industry required a more aggressive strategic positioning in terms of biotechnology. However, the individual companies lacked the technological and financial resources to maintain a sustained effort in the area. This is characterized by continual innovation, technical complexity, mastery of specific knowledge, need for specialized equipment and uncertainty in terms of return on investment. For these reasons, a project for forming a research network of a pre-competitive nature was the model adopted.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

14

The Genolyptus Network was formally established in February of 2002. Researchers from several universities were invited on the basis of their previous relationships with the companies, their productivity and ability to contribute to the project (resource complementarities).

The sharing of costs and the learning possibilities were among the important factors pointed out as the principal motivations for the creation of the network. The points that enabled its formation, however, followed particular criteria. According to the network coordinator, several of these aspects are linked to the characteristics of the sector, to the historical pattern of interrelationships between the organizations and also the technical characteristics of the research and technology involved.

For a better understanding of the functioning of the network, the structure used will be described, such as the contract, the administrative structure, and the coordination of the network and its board of directors.

5. NETWORK GOVERNANCE

For an effective functioning of a network such as this, encompassing very distinct institutions, the establishment of clear rules and norms that established its *modus operandi* was of fundamental importance. This can be pointed out as a distinguishing feature in Genolyptus, in that there was a well-structured agreement and work plan. The first regulated those questions linked to financial support and genetic material provided by the institutions, the structure of the governance of the network and intellectual property. The second established the division of labour and the goals of each member, in agreement with nine interlinked subprojects between them.

The coordination of the project was assigned to Embrapa, while the managerial aspects in the administrative/accounting areas of the network remained the responsibility of an external institution, Funarbe, a foundation connected to the Federal University of Viçosa. The project was subdivided into nine subprojects and for each there was a coordinator. In a general fashion, they were responsible for the institutional aspects of the networks and its day-to-day operations. There was also a board of directors which monitored the deadlines and fulfilment of the financial schedule for the project.

5.1. The contract

The contract, also known as the Terms of Agreement (TA), was negotiated by the director of intellectual property of Embrapa, specialized in drawing up contracts in the area of biotechnology, in collaboration with the legal departments of the companies and universities. A period of twelve months elapsed between the initial discussions on drawing-up the TA and its finalization. There was

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

15

considerable debate in the network and the contract underwent various changes and rounds of successive discussions, in which the legal representatives of the companies played an active role.

The objective of the TA was to regulate the rights of commercialization and the use of intellectual property and ownership rights, as well as acquiring the results, be they patentable or not. In addition, the TA also dealt with:

- The provision of financial resources by the companies and the provision of genetic material.
- The execution of technical tasks to be carried out by those performing the work.
- The creation and functioning of the Board of Directors and Technical Committee comprised of representatives from the Companies and those executing tasks. In these forums, administrative and technical questions concerning the execution of the project were resolved.
- The ownership of the intellectual property rights to products and processes that were developed during the project.

As an annex to the TA, a work plan was drawn up, which stipulated periodic evaluations of the progress of subprojects, and which could be used as a device to sever links with institutions that failed to adhere, without just cause, to the planned schedule.

With regard to intellectual property, it was established that, in positive cases, the products and processes would be protected in the name of all the companies and those involved, and that each type of result, that is to say, data base, software, eucalyptus cultivars, brands, products and processes would fall under specific laws.

However, should the products or processes subject to intellectual protection be the result of investments and intellectual creation of the company or the individual involved, even when using data obtained through the project and used as a source of research, these could be protected at the discretion and expense of the others.

The TA envisaged the signature of a confidentiality clause by the participants and defined the procedure for the publication of results in the form of scientific articles, abstracts and data bases etc.

It was agreed that the companies that provided the genetic material during the project would continue to maintain full proprietorship of it. However, the products derived from the use of this material in the project were to be considered genetic innovation, and thus results of the project. In this way it was possible for the companies and individuals responsible to protect the intellectual rights. The genetic material made available to Genolyptus by the companies was destined for setting up a series of experiments, located in chosen companies. These, in turn, granted access to the experiment sites.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

16

Another item that was much debated in the network was in reference to publication. Clear criteria were sought that would minimize doubts in regard to these decisions, such the inclusion of justifications for rejecting studies. The Council was responsible to decide whether or not to publish.

When it came to communications and new items, it was agreed that all reports and any other sort of communication had to be made in writing, or via e-mail, telephone calls or dispatched or registered mail. Those reports sent by fax or made via telephone had to be confirmed in writing, and all communications came into effect from the moment of receipt.

5.2. Administrative structure

The administrative management of the project was undertaken by Funarbe, which was responsible for the administration and accounting, for importing equipment and necessary supplies, as well as contracting temporary personnel.

In relation to the distribution of resources and the administration of financial resources, it was established in the contract that Funarbe would be responsible for its administration, yet the following division was to prevail:

"The key word "in dividing the cake" in the use of resources is GOOD SENSE, MOTIVATION AND TEAM SPIRIT, and I am certain that everyone will agree with this. The technical committee will have the responsibility of authorizing disbursements for the use of resources in accordance with the control of the productivity of the laboratories, as well as the costs associated with travel, daily allowances, services etc."

5.3. Coordination

The coordination of Genolyptus was comprised of the general coordination and nine subproject coordinators. Thus a decentralized form of coordination was chosen. The nine coordinators were responsible for the execution of the physical schedule of established goals and reported to the Board of Directors and the external evaluation committee on the fulfilment of that which had been agreed upon in the TA. In the majority of the subprojects, the coordination was shared in such a way as to distribute the tasks and having a substitute that would guarantee success in the projects.

Biannual monitoring meetings were held with the participation of the coordinators, the board of directors and the members of the project. Aside from these, there were also periodic meetings between

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

17

the researchers – universities and companies –, submission of reports and annual meetings of all the team with the external evaluation committee, as well as technical-scientific project workshops.

It was established in the contract that the goals for each subproject would be laid out in common agreement between the subproject coordinator and the other members of the team. The definition of tasks, deadlines and specific responsibilities would be made in technical meetings and/or contacts via e-mail and recorded in the minutes.

Despite this division, the network coordinator was fundamental. This individual had the central role of animating the Network. He raised questions, opened debate, kept the Network informed, minimized asymmetries in information, encouraged participation, organized events, intervened with the government agencies that financed the Network etc.

5.4. Board of directors and technical committee

The Board of Directors was formed by two representatives from each company, an incumbent and a substitute. The function of the board was to resolve administrative and technical questions described in the internal regulations. Its basic functions were to establish the policies, objectives and general orientation of the Network, to deal with unresolved cases and to oversee the management of the Technical Committee.

The minimum *quorum* for holding Board meetings was seven, and the decisions were taken by a majority of the members present. Exceptions to the rule were cases which involved modification of the initial budget, the schedule of contributions, acceptance of new participants. These issues required 100% of the vote of those present.

The Board of Directors elected the Technical Committee, whose functions were:

- To manage and evaluate technical matters and results relating to the projects.
- To draw up biannual technical reports and present to the Board of Directors the priorities in terms of allocation of resources, budgets and investments.
- To be responsible for the preliminary evidence when submitting patent requests.
- To represent the other members of the Board of Directors in external technical meetings, presentations, seminars, workshops, congresses, or nominate, from among their members, a spokesperson.

Having described the structure of the network, contracts and other institutions that enabled the contractual governance of the network, it is now necessary to describe and discuss the processes and

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

18

instruments that permeated this structure. The two processes that will be analysed refer to the network management and the management of knowledge.

6. THE PROCEDURAL GOVERNANCE IN THE GENOLYPTUS NETWORK

To explain the mechanisms utilized for the daily management of the network – the procedural governance –, two processes were chosen.

The work began with an understanding that the processes linked to the management of the network and knowledge were essential. The imposition of this choice was based on the fact that the survival and growth of organizations is increasingly supported by the generation, acquisition and transformation of knowledge (Inkpen & Dinur, 1998). For authors linked to evolutionary schools, an objective of organizations is to respond to problems related to knowledge (Nelson & Winter, 1982). This imposition is reaffirmed in studies that focus on networks. Added to this is the fact that networks configure themselves, more and more, into environments for developing and accessing different types of knowledge, in other words, learning environments (Easterby-Smith, Lyles, & Tsang, 2008).

Understanding the management process also emerges as being fundamentally important. Organizations find themselves in environments marked by conflict, the resolution of which proceeds by definition from a common base, with codes, world visions, and languages shared between individuals (Milagres, 2008). This is a phenomenon that is accentuated in networks, since they bring together different organizations, each with their unique characteristics, such as the specific characteristics of the organizational culture. Again, an understanding of the process that enables management is of great value.

6.1 Management process and its tools

With reference to the process as a whole, the informality with which the network was organized and how the tools were used should be emphasized. This was the result of the number of previous relationships existing between the companies and the other institutions involved, as well as the individual relationships between the participants.

The flow for decision making was comprised of tools that stressed information symmetry and the consensus between the participants, and, consequently, the attempt to minimize conflicts. In this way, much time was invested in debate with wide-ranging discussions that took place through e-mails and face-to-face meetings. These were divided between formal sessions, which occurred periodically, such as happened for the subprojects, and informal meetings, which occurred when more complex situations involving differences in interest and divergences of opinion arose.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

19

Seeing that there was no formal hierarchy, and given the number of participants, the diversity of interests between, principally, universities and companies, and the informal character of the established relationships, it can be seen that the role of the coordinator was fundamental.

The monitoring of the network results was carried out by the coordinator as laid down in the contract, that is, formal evaluations were made using established targets and schedules, as well as by means of publication of the progress of the work in minutes and reports. Bearing in mind the history of organizational relationships and individuals that characterized the sector, there were also informal evaluations through telephone calls and e-mails.

In a general manner, it may be concluded that the management process, as a whole, relied on a set of tools that made clear the behaviour to be adopted. In this way, these instruments guaranteed a *modus operandi* or set of rules that enabled management of the network.

Three further points are worthy of note. The first concerns the number of discussions via e-mail regarding management that were concentrated in the year that preceded the official formation and in the first year of operation of the network itself, in other words, in its phase of constitution. In this period, almost 60% of the e-mails dealing with the subject were exchanged. In this phase, the participants asked for clear rules that would guide the work and made great efforts to establish these.

"...the search for a minimum management for us to work – I'm not talking of statutes. We are talking here about the minimal rules as how to decide – votes or consensus, the weight of the research institutions and companies in these votes…"

As Genolyptus developed, the participants went on to view these rules in a flexible manner. That is to say that many stated that the contract lost importance. For them, what guided the work were the tools that were present in the day-to-day operations. According to them, the contract was forgotten.

"A contract is a legal instrument..., but it doesn't set up the way to behave in the network."

"Rarely did people resort to the contract... The daily operations of the network actually are formed by the patterns of behaviour, by the way of doing things..."

In talking about the dynamism of the management process in a general fashion, the participants stated that there was learning throughout this experience and that it underwent small modifications. However, when questioned as to whether there was change, the reply was negative. In other words, the tools linked to the process were seen as static. During the interviews, the respondents voluntarily made comments on the progress of the network over the five years that had passed since its inception. Many believed that some changes should have been made, and, with these, the process and results could have been better.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

20

6.2 Knowledge management process

In the knowledge management process – its creation and transfer –, the tools developed were characterized by informality in the same way that was pointed out earlier; the previous relationships that had existed between the participants ensured this type of management.

By analysing the documents and the interviews, it emerged that for the creation of knowledge to take place, tools that allowed the face-to-face exchange of knowledge were given the greatest importance. This fact is due to the tacit and complex nature of the knowledge to be developed. In this way, meetings, visits and the sharing, analysis and development of genetic material, methods, courses, training sessions and consultations etc. were stressed. These emphasized the personal contact between organizations. For codified information exchange, meeting minutes, reports and other publications and forums were the channels employed.

Highlighted among those tools adopted were discussions via e-mail, telephone calls and annual meetings. The first became an important forum for the circulation of information, the creation and sharing of knowledge, notable for its informal character.

When it came to dynamism, the respondents evaluated these tools as static. They stated that there was learning over time, but these tools were rigidly moulded and induced certain behaviours.

The greater number of e-mails was concentrated in 2002 and 2003, with approximately 50% in 2002, the year in which the rules for the network were established.

Having presented the structure of the network governance and its management tools, these shall now be analysed.

7. DISCUSSION

The central objective of this work was to understand the governance structure and the management tools used in the Genolyptus Network. Therefore, we first sought to identify these in order to formulate some ideas about them, and then, based on previous literature and case description, we sought to highlight aspects which influenced the establishment of its governance structure.

The need to set up governance structures and specific tools - as shown in the section on the theoretical background - characterized the initial discussions that were held in the network. As a result, drawing-up the TA, in which the formal rules were established, took more than a year. Added to this was the concentration of e-mails that focused on the discussion of this framework during this

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

21

initial phase of the partnership. As the participants stated, the establishment of these rules provided a reference that guided the work. In accordance with Britto (1999) and Gulati (1995), the creation of this set of formal rules helps to establish patterns of behaviour and minimizes uncertainty, paving the way for the management of the network.

However, as the network developed, the formal rules gave way to another set of tools that went on to govern the network in its day-to-day operations. Here, the respondents emphasized the informal rules and standards of behaviour that composed the procedural governance. They were constructed during the evolution of the network and characterized the learning process that was established throughout it. As demonstrated by different authors (Doz, 1996; Ring & Van De Ven, 1994; Gulati, 1995), the networks opened up to this type of learning that allowed the exchange of specific knowledge, as well as knowledge about the organizational context of each partner. Britto (1999) called this process learning by learning.

The importance of experience and its influence - A strong characteristic of the Genolyptus Network was the predominance of its informal character. According to the interviews, this was due to the experience derived from previous partnerships and personal and institutional relationships experienced by the sector. Various authors have discussed the importance and influence of past experiences in the formation of management tools (Powell, Koput, & Smith-Doerr, 1996; Anand & Khanna, 2000). The learning produced by these experiences influences the governance structure – the formation of formal and informal contracts (Simonin, 1997). To which should be added the fact that past agreements promote trust, and thus facilitate management of the partnership. The management instruments can be transferred and, because of this, tend to be more developed. As Gulati (1995) stated, these instruments allow the behaviour of the partners to be predicted and open space for the use of more informal rules and procedures.

The specificities of the context and their influence - On the other hand, among the authors that work with the importance of experience, some have stressed the need to take into account the specificities of the context (Gulati, 1999) and, consequently, the difficulties of transferring the established management tools. These studies point out that those tools are context dependent, showing causal ambiguity, and are socially complex (Simonin, 1997). From this point of view, relationships between the organizations are specific. In this case, revolving around the tools used, there is learning about the practices, values, and cultures of the organizations involved. The network in question demonstrated the importance of these elements highlighted above in emphasizing the possibility of transfer of the instruments created in the networks over the history of the sector. The study showed, in conformity with Simonin (1997), that not only the experience, but its consolidation into management

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

22

tools ensured the possibility of transferring the accumulated learning. Besides this, the involvement of the participants over the years promoted trust and consequently opened space for informal management procedures.

As a product of this history of relationships, the Genolyptus Network could profit from a context characterized by the creation of common intangible assets such as reputation, trust, codes and values, accumulated instruments etc. As pointed out previously this context generated stability, minimizing the uncertainties and facilitating its management. It may be further added that the perception of the sector with regard to its interdependence for the achievement and maintenance of competitive advantages established what Parkhe (1993) has termed the "shadow of the future". This perception enabled the participants to avoid conflict situations and behaviours that were not in line with what had been previously set out in formal and informal terms. Confirming this hypothesis, various authors have emphasized the importance of context in understanding actions and behaviours in the network. Granovetter (1985) has stressed the embedded nature of relations, Dyer and Singh (1998) have worked with the formation of relational capital and its implications, while Gulati (1995, 2007) has discussed the history of relationships and the repetitive interactions that can create loyalty and impacts on the future governance of other partnerships.

The knowledge characteristics and its influence - Another specific aspect pointed out by the respondents was the characteristics of the knowledge worked with – complex, tacit, codified and characterized by strong uncertainty in terms of possession of the results. In influencing the choice of certain tools these characteristics could limit the possibility of their transfer. This relationship between the management tools, specifically routines and knowledge, has already been reported by studies made in the literature on the sectorial system of innovation, an important reference for which is Malerba (2002).

The learning mechanisms - Doz (1996), Ring and Van De Ven (1994) and Britto (1999) emphasize learning mechanisms and the constant revision of the network development process and its tools. However, in the opinion of the respondents, the tools adopted seemed static. Although there had been several opportunities for change during the network's history, they had not been modified. Nevertheless, it is worth noting the learning process reported by the interviewees. For them, the reduction in face-to-face meetings and incidents in which polemical topics and conflicts emerged was an indicator that there was learning and that the tools had matured.

Given this, it remains to comment on the weight of the history of the network, the recognition of mutual dependence and, consequently, the presence of the phenomenon "the shadow of the future" and the learning process throughout the network. If, on the one hand, these elements made

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

23

management easier by promoting trust and relational capital, as well as by permitting economy in the development of management tools, they also raised some interesting questions. The possibility of renewing partnerships and the mutual dependence in order to develop imposes, up to a point, the maintenance of the same tools. This is because, in reproducing past experiences, the partners avoid conflicts. This raises a question: To what extent does the repetition of the partnerships promote the advance of the management tools and governance, and at what point does it become an impediment to its advance?

Gulati (1995), for example, states that from a certain point on, cooperation between the same partners may impact negatively its attractiveness. This is because it increases interdependence, reduces the possibilities of exchange and limits the space for the search for other partners. The characteristics of knowledge can also be added to the question. It may be further asked whether this repetition could have been better in those sectors in which the development of knowledge and technology was more mature, as discussed by Dyer, Kale and Singh (2004).

Finally it should be stressed that aspects such as convergence of objectives and reputation of the agents were shown to be present in the study and were important for the adhesion of the partners to the network (Nielsen, 2010). In the specific case of reputation, the importance given to technical aspects and equally to interactive relationships is a salient feature.

7.1 Final considerations and research implications

The importance of cooperative networks is growing. Many sectors and companies have opted for this strategy. However, some questions about governance structures needed to be answered. In the literature evidence can be found that problems in networks can be attributed to the inadequacy of management tools and governance structure (Dyer, Kale, & Singh, 2004). This article hopes to contribute to this debate by presenting the governance structure and management tools used by the Genolyptus Network.

The case demonstrated the importance of establishing a governance structure and management tools for the conduct of the network. This was evidenced by the investment of the participants in designing the governance structure when setting up the network, by the number of e-mails exchanged for this purpose and by the statements and requests on the part of the participants for the establishment of clear rules of conduct. This fact illustrates the importance of this type of investment on the part of the network managers. It is frequently believed that the existence of convergent objectives is sufficient for the establishment of partnerships and, as a consequence, little is invested in the structure and development of specific management tools, especially procedural governance, thus compromising future results.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

24

However, the network also demonstrated that this framework is not enough. In addition, it must be complemented throughout the process by an informal structure, suggesting continual investments on the part of the executives. Such evidence proves the process of learning experienced and the constant cycles of redesign of its structure, as shown by Doz (1996), Larson (1992) and Ring and Van De Ven (1994).

However, the Genolyptus Network also demonstrates that the learning process needs to be carefully understood, and how it is influenced by other characteristics such as the context into which the participants are inserted. Aspects such as the possibility of future partnerships, the reputation of the agents, the personal and institutional relationships, among others, can impact this learning.

Another important fact learned from this experience refers to the possibility of transferring management tools, since certain specific aspects were observed. In the case of Genolyptus, impacting on this possibility were: personal characteristics observed in the coordination, characteristics in the knowledge worked with, specificity of the sector characterized by a history of prior relationships, interdependence and social context.

In relation to this aspect, one must pay attention to the need for organizations to invest in this learning, which needs to be consolidated in the development of capabilities, by the internalization and incorporation of the lessons learned into routines, and not merely by leaving the experiences to accumulate, as proposed by Simonin (1997).

Also in relation to the possibility of transfer, it should be emphasized that managers need to be aware of the advantages and disadvantages linked to the repetition of partnerships, especially in knowledge-intensive sectors.

Finally it is worth mentioning that all these conclusions should be tested in different environments. This is because the used methodology is based on a single case.

REFERENCES

Anand, B., & Khanna, T. (2000, March). Do firms learn to create value? The case of alliances. *Strategic Management Journal, 21*(3), 295-315. doi: 10.1002/(SICI)1097-0266(200003)21:3<295::AID-SMJ91>3.0.CO;2-O.

Britto, J. N. P. (1999). *Características estruturais e modus-operandi das redes de firmas em condições de diversidade tecnológica.* (Tese de doutorado). Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brasil.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

25

Breschi, S., & Malerba, F. (1997). Sectoral innovation systems: technological regimes, Schumpeterian dynamics, and spatial boundaries. In C. Edquist (Ed.), *Systems of innovation*: *technologies, institutions and organizations* (pp. 130-156). London: Pinter.

Doz, Y. (1996, Summer). The evolution of cooperation in strategic alliances: initial conditions or learning processes? *Strategic Management Journal*, *17*(7), 55-83. doi: 10.1002/smj.4250171006.

Dyer, J. H., & Singh, H. (1998, October). The relational view: cooperative strategy and sources of interorganizational competitive advantage. *The Academy of Management Review, 23*(4), 660-679. doi:10.5465/AMR.1998.1255632.

Dyer, J. H., Kale, P., & Singh, H. (2004, July/August). When to ally and when to acquire. *Harvard Business Review*, *82*(7/8), 109-115.

Dyer, J., & Hatch, N. (2006, August). Relation-specific capabilities and barriers to knowledge transfers: creating advantage through network relationships. *Strategic Management Journal, 27*(8), 701-719. doi: 10.1002/smj.543.

Easterby-Smith, M., Lyles, M.A., & Tsang, E. W.K. (2008, June). Inter-organizational knowledge transfer: current themes and future prospects. *Journal of Management Studies, 4* (4), 677-690. doi: 10.1111/j.1467-6486.2008.00773.x.

Gilsing, V. A., Lemmens, C. E. A.V., & Duysters, G. (2007, March). Strategic alliance networks and innovation: a deterministic and voluntaristic view combined. *Technology Analysis & Strategic Management, 19*(2), 227-249. doi: 10.1080/09537320601168151.

Giuri, P., Hagedoorn, J., & Mariani, M. (2002, February). Technological diversification and strategic alliances. [Working Paper Series 2002/04]. *Laboratory of Economics and Management (LEM) Sant'Anna School of Advanced Studies,* Pisa, Italy.

Granovetter, M. (1985, November). Economic action and social structure: the problem of embeddedness. *The American Journal of Sociology*, *91*(3), 481-510. doi: 10.1086/228311

Gulati, R. (1995, February). Does familiarity breed trust? The implications of repeated ties for contractual choice in alliances. *Academy of Management Journal, 38*(1), 85-112. doi: 10.2307/256729.

Gulati, R. (1999, May). Network location and learning: the influence of network resources and firm capabilities on alliance formation. *Strategic Management Journal, 20*(5), 397-420. doi: 10.1002/(SICI)1097-0266(199905)20:5<397::AID-SMJ35>3.0.CO;2-K

Gulati, R. (2007). *Managing network resources*: *alliances, affiliations, and other relational assets*. New York: Oxford University Press.

Hagedoorn, J., & Hesen, G. (2007, May). Contract law and the governance on inter-firm technology partnerships – an analysis of different modes of partnering and their contractual implications. *Journal of Management Studies, 44*(3), 343-366. doi: 10.1111/j.1467-6486.2006.00679.x.

Harryson, S., Dudkowski, R., & Stern, A. (2008, June). Transforming networks in innovation alliances – the development of Volvo C70. *Journal of Management Studies, 45*(4), 746-773. doi: 10.1111/j.1467-6486.2008.00768.x.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

26

Heimeriks, K., Klijn, E., & Reuer, J. (2009, February). Building capabilities for alliance portfolio. *Long Range Planning*, *42*(1), 96-114. doi:10.1016/j.lrp.2008.10.005.

Heimeriks, K., & Duysters, G., (2007, January). Alliance capability as a mediator between experience and alliance performance: an empirical investigation into the alliance capability development process. *Journal of Management Studies*, *44*(1), 25-49. doi: 10.1111/j.1467-6486.2006.00639.x.

Heimeriks, K. H., Duysters, G., & Vanhaverbeke, W. (2007, November). Learning mechanisms and differential performance in alliance portfolios. *Strategic Organization, 5*(4), 373 -408. doi: 10.1177/1476127007083347.

Hughes, J., & Weiss, J., (2007, November). Simple rules for making alliances work. *Harvard Business Review, 85*(11), 122-131.

Inpken, A., & Dinur, A. (1998, July/August). Knowledge management processes and international joint ventures. *Organization Science*, *9*(4), 454-468. doi: 10.1287/orsc.9.4.454.

Kale, P., & Singh, H. (2007, October). Building firm capabilities through learning: the role of the alliance learning process in alliance capability and firm-level alliance success. *Strategic Management Journal, 28*(10), 981-1000. doi.org/10.1002/smj.616.

Knudsen, L. & Nielsen, B. (2009). Antecedents of procedural governance in knowledge - sharing alliances. *In W. R. King (Eds.). Annals of Information Systems* (pp.145-161): New York: Springer.

Kogut, B., & Zander, U. (1992, August). Knowledge of the firm, combinative, capabilities, and the replication of technology. *Organization Science, 3*(3), 383-397. doi: 10.1287/orsc.3.3.383.

Larson, A. (1992, March). Network dyads in entrepreneurial settings: a study of the governance of exchange relationships. *Administrative Science Quarterly, 37*(1), 76-104. doi: org/10.2307/2393534.

Lee, G. K. (2007, January). The significance of network resources in the race to enter emerging product markets: the convergence of telephony communications and computer networking, 1989-2001. *Strategic Management Journal, 28*(1), 17-37. doi: 10.1002/smj.566.

Lubatkin, M., Calori, R., Very, P., & Veiga, J. F. (1998, Nov./Dec.). Management mergers across borders: a two-nation exploration of a nationally bound administrative heritage. *Organization Science*, *9*(6), 670-684. doi:10.1287/orsc.9.6.670.

Mahnke, V. (2000, October). Limits to outsourcing and the evolutionary perspective on firm boundaries. [Working Paper]. *Department Business School*, Copenhagen Business School. Recuperado em 09 agosto, 2011, de
http://openarchive.cbs.dk/bitstream/handle/10398/6899/wp00-13.pdf?sequence=1

Malerba, F. (1992, July). Learning by firms and incremental technical change. *Economic Journal*, *102*(413), 845-859. doi: 10.2307/2234581.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

27

Malerba, F. (2002). *Sectoral systems of innovation:* concepts, issues and analyses of six major sectors in Europe. New York: Cambridge University.

Milagres, R. (2011, Jan./Jun.). Rotinas: uma revisão teórica. *Revista Brasileira de Inovação, 10*(1), 161-196.

Möller, K., Rajala, A., & Svahn, S. (2005, September). Strategic business net – their type and management. *Journal of Business Research, 58*(9), 1274-1284. doi: 10.1016/j.jbusres.2003. 05.002.

Möller, K., & Rajala. A. (2007, October). Rise of strategic nets – new models of value creation. *Industrial Marketing Management, 36*(7), 895-908. doi: 10.1016/j.indmarman.2007. 05.016.

Nelson, R., & Winter, S. G. (1985). *An evolutionary theory of economic change*. Cambridge: Harvard University Press.

Ness, H. (2009, May). Governance, negotiations, and alliance dynamics: explaining the evolution of relational practice. *Journal of Management Studies, 46*(3), 451-480. doi: 10.1111/j.1467-6486.2008.00818.x.

Nielsen, B. (2010, July). Strategic fit, contractual, and procedural governance in alliances. *Journal of Business Research 63*(7), 682-689. doi: 10.1016/j.jbusres.2009.05.001.

Nooteboom, B., Berger, H., & Noorderhaven, N. G. (1997, April). Effects of trust and governance on relational risk. *Academy of Management Journal, 4*0(2), 308-338. doi: 10.2307/256885.

Parkhe, A. (1993, August). Strategic alliance structuring: a game theoretic and transaction cost examination of interfirm cooperation. *Academy of Management Journal*, *36*(4), 794-829. doi: 10.2307/256759.

Powell, W.W., Koput, K.W., & Smith-Doerr, L. (1996, March). Interorganizational collaboration and the locus of innovation: networks of learning biotechnology. *Administrative Science Quarterly*, *41*(1), 116-145. doi:10.2307/2393988.

Reuer, J., & Ariño, A. (2007, March). Strategic alliance contracts: dimensions and determinants of contractual complexity. *Strategic Management Journal 28*(3), 313-330. doi: 10.1002/smj.581.

Ring, P., & Van de Ven, A. (1994, January). Developmental processes of cooperative interorganizational relationships. *Academy of Management Review, 19*(1), 90-118. doi: 10.5465/AMR.1994.9410122009.

Ring, P. S., Doz, Y. L., & Olk, P. M. (2005, Summer). Managing formation processes in R&D consortia. California Management Review, 47(4), 137-156.

Rothaermel, F. T., & Deeds, D. L. (2006, July). Alliance type, alliance experience and alliance management capability in high-technology ventures. Journal of Business Venturing, *21*(4), 429-460. doi: 10.1016/j.jbusvent.2005.02.006.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07,29, jul./set. 2014.

28

Simonin, B. L. (1997, October). The importance of collaborative know-how: an empirical test of the learning organization. *Academy of Management Journal, 40*(5), 1150-1174. doi: 10.2307/256930.

Sluyts, K., Martens, R., & Matthyssens, P. (2008, June). Towards a dynamic concept of alliance capability. [Working Paper, 2008019]. *University of Antwerp, Faculty of Applied Economics.* Retrieved from http://ideas.repec.org/a/eee/jbvent/v21y2006i4p429-460.html

A ESTRUTURA DE GOVERNANÇA DE REDES DE COOPERAÇÃO – O CASO GENOLYPTUS

Resumo

Redes cooperativas constituem uma unidade crítica para a análise da inovação. Apesar disso, redes são estruturas complexas no que se refere à sua gestão. Algumas dificuldades, de acordo com a literatura, estão associadas à ausência de instrumentos específicos de gestão, problemas relacionados à governança, assim como as assimetrias relacionadas aos objetivos estabelecidos. O estudo de caso apresentado procura contribuir com este debate ao examinar a estrutura de governança e os instrumentos utilizados pela Rede Genolyptus. A pesquisa demonstra a importância dessa estrutura e a necessidade de investimentos regulares em seu desenvolvimento. A análise mostrou também que a estrutura de governança foi influenciada pela experiência dos parceiros, pelos tipos de conhecimento utilizados e pelo contexto em que a rede se desenvolveu. Além desses aspectos, o caso destaca a importância do aprendizado durante o processo, mas salienta que esse aprendizado pode ser negativamente influenciado pelo contexto e pela possibilidade de futuras parcerias.

Palavras-chave: Redes de colaboração; Governança; Gestão de redes; Transferência de conhecimento.

Revista de Administração e Inovação, São Paulo, v. 11, n.3, p.07-29, jul./set. 2014.

29